

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) A voltage-controlled oscillator comprising:

a voltage-controlled oscillation circuit that oscillates at a frequency according to a control voltage; and

a limiter circuit that, if an output of the voltage-controlled oscillator is higher than a predetermined level, limits ~~an~~ the output of the voltage-controlled oscillator to a the predetermined level,

wherein, even when, according to the control voltage, the output of the voltage-controlled oscillator varies along with the frequency at which the voltage-controlled oscillator is oscillating, if the output of the voltage-controlled oscillator is higher than the predetermined level, an output of the limiter circuit is kept at a constant level.

2. (original) The voltage-controlled oscillator according to claim 1,

wherein the limiter circuit includes a differential amplifier circuit that receives the output of the voltage-controlled oscillation circuit and operates in a saturated state.

3. (original) The voltage-controlled oscillator according to claim 2,

wherein the differential amplifier circuit operates from an operation current produced by a constant current source that produces a constant current by applying a predetermined voltage to a current producing resistor.

4. (original) The voltage-controlled oscillator according to claim 3,

wherein the current producing resistor is a device of a same type as a load resistor of the differential amplifier, and is placed near the load resistor.

5. (original) The voltage-controlled oscillator according to claim 3,

wherein the predetermined voltage is produced by a band-gap circuit.

6. (original) The voltage-controlled oscillator according to claim 1,

wherein a supply power line to the voltage-controlled oscillation circuit and a supply power line to the limiter circuit are separate from each other.

7. (currently amended) A voltage-controlled oscillator comprising:

a plurality of voltage-controlled oscillation circuits that oscillate at a frequency according to a control voltage;

a selector circuit that selects one of the voltage-controlled oscillation circuits and makes the selected voltage-controlled oscillation circuit operate; and

a limiter circuit that, if an output of the selected voltage-controlled oscillator is higher than a predetermined level, limits an the output of the selected voltage-controlled oscillation circuit to a the predetermined level,

wherein, even when outputs of the plurality of voltage-controlled oscillation circuits have different levels, if the output of the selected voltage-controlled oscillator is higher than the predetermined level, an output of the limiter circuit is kept at a constant level.

8. (original) The voltage-controlled oscillator according to claim 7,

wherein the limiter circuit includes a differential amplifier circuit that receives the output of the voltage-controlled oscillation circuit and operates in a saturated state.

9. (original) The voltage-controlled oscillator according to claim 8,

wherein the differential amplifier circuit operates from an operation current produced by a constant current source that produces a constant current by applying a predetermined voltage to a current producing resistor.

10. (original) The voltage-controlled oscillator according to claim 9,

wherein the current producing resistor is a device of a same type as a load resistor of the differential amplifier, and is placed near the load resistor.

11. (original) The voltage-controlled oscillator according to claim 9,

wherein the predetermined voltage is produced by a band-gap circuit.

12. (original) The voltage-controlled oscillator according to claim 7,

wherein the limiter circuit is so placed that wiring conductors thereto from the individual voltage-controlled oscillation circuits are equally long.

13. (original) The voltage-controlled oscillator according to claim 7,

wherein the limiter circuit is so placed that wiring conductors thereto from the individual voltage-controlled oscillation circuits are decreasingly long in order of decreasing output levels from the voltage-controlled oscillation circuits.

14. (original) The voltage-controlled oscillator according to claim 7,

wherein a supply power line to the voltage-controlled oscillation circuits and a supply power line to the limiter circuit are separate from each other.

15. (original) A voltage-controlled oscillator comprising:

a plurality of voltage-controlled oscillation circuits that oscillate at a frequency according to a control voltage; and

a selector circuit that selects one of the voltage-controlled oscillation circuits and makes the selected voltage-controlled oscillation circuit operate,

wherein variable oscillation frequency ranges of adjacent voltage-controlled oscillation circuits are so set as to overlap at ends thereof, and variable oscillation frequency ranges of the individual voltage-controlled oscillation circuits are so adjusted that an upper end frequency of an n th (where $n \geq 1$) voltage-controlled oscillation circuit as observed when most deviated on a low side is higher than a lower end frequency of m th (where $m = n + 1$) voltage-controlled oscillation circuit as observed when most deviated on a high side.

16. (currently amended) An integrated circuit device comprising:

a voltage-controlled oscillator including a voltage-controlled oscillation circuit that oscillates at a frequency according to a control voltage and a limiter circuit that, if an output of the voltage-controlled oscillator is higher than a predetermined level, limits an the output of the voltage-controlled oscillator to a the predetermined level,

wherein, even when, according to the control voltage, the output of the voltage-controlled oscillator varies along with the frequency at which the voltage-controlled oscillator is oscillating, if the output of the voltage-controlled oscillator

is higher than the predetermined level, an output of the limiter circuit is kept at a constant level.

17. (currently amended) An integrated circuit device comprising:

a voltage-controlled oscillator including a plurality of voltage-controlled oscillation circuits that oscillate at a frequency according to a control voltage, a selector circuit that selects one of the voltage-controlled oscillation circuits and makes the selected voltage-controlled oscillation circuit operate, and a limiter circuit that, if an output of the selected voltage-controlled oscillator is higher than a predetermined level, limits ~~an~~ the output of the selected voltage-controlled oscillation circuit to ~~a~~ the predetermined level,

wherein, even when outputs of the plurality of voltage-controlled oscillation circuits have different levels, if the output of the selected voltage-controlled oscillator is higher than the predetermined level, an output of the limiter circuit is kept at a constant level.

18. (original) An integrated circuit device comprising:

a voltage-controlled oscillator comprising a plurality of voltage-controlled oscillation circuits that oscillate at a frequency according to a control voltage and a selector circuit that selects one of the voltage-controlled oscillation circuits and makes the selected voltage-controlled oscillation circuit operate,

wherein variable oscillation frequency ranges of adjacent voltage-controlled oscillation circuits are so set as to overlap at ends thereof, and variable oscillation frequency ranges of the individual voltage-controlled oscillation circuits are so adjusted that an upper end frequency of an n th (where $n \geq 1$) voltage-controlled oscillation circuit as observed when most deviated on a low side is higher than a lower end frequency of an m th (where $m = n + 1$) voltage-controlled oscillation circuit as observed when most deviated on a high side.